

GCU-44 Ver1.0

Auto Start Genset Control Panel

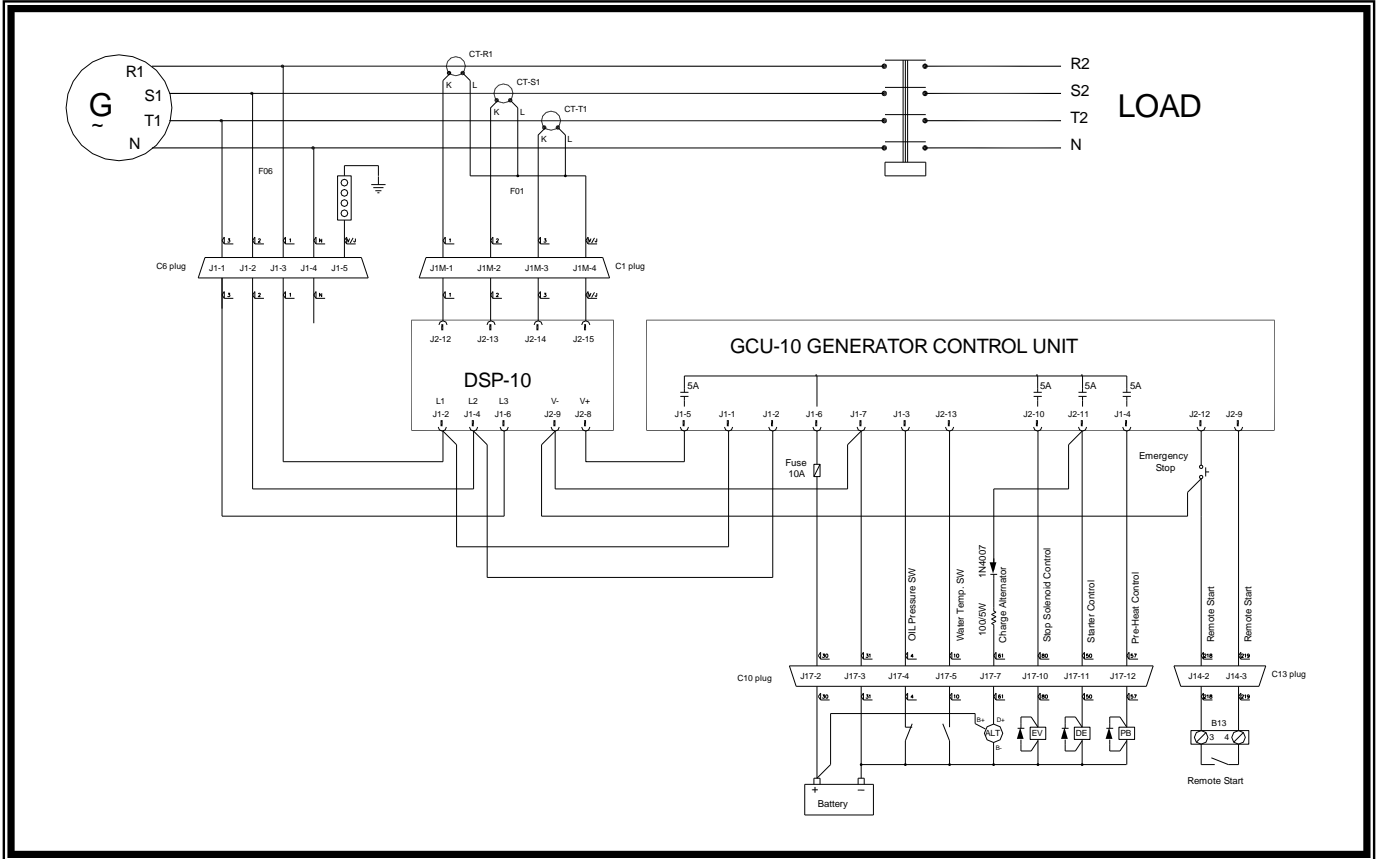


Introduction

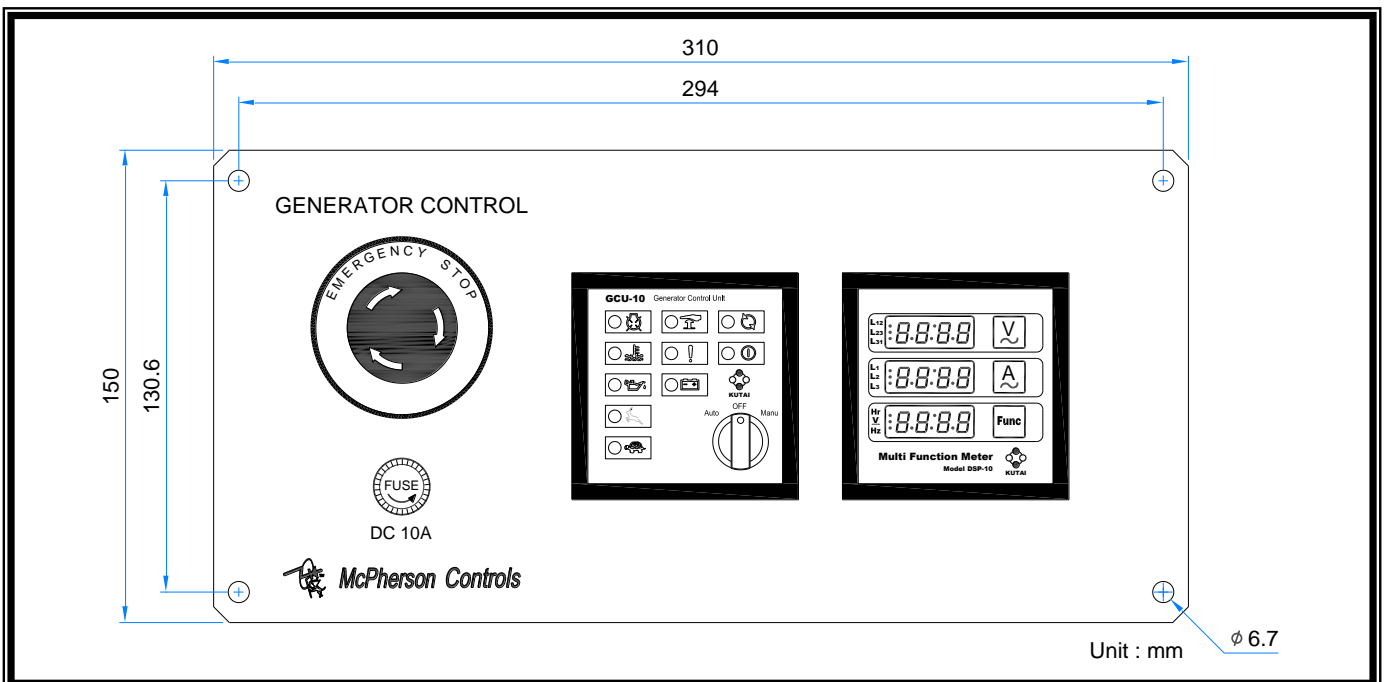
GCU-44 control panel contains GCU-10 automatic engine control unit and DSP-10 Genset multi-function display module, which is specially designed to replace NEXYS controller. Simply connect the corresponding wire of the new harness of the GCU-44 to the original connector to easily complete the replacement.

For detailed functions and settings of GCU-10 and DSP-10, refer to the contents of the user manual below.

Wiring Diagram



Outline Dimensions



GCU-10

Automatic Engine Control Unit



The Model GCU-10 is an Automatic Engine Control Module, designed to meet the demand of the generator industry. The module starts and stops the generator, and at the same time indicates the operation status and fault conditions, If it senses a fault it will automatically shuts down the engine and indicates the engine failure by means of eight LED's. The technician can program the module according to different generator requirements complying with different conditions and protections.

Protection Functions

Engine fail to start reattempt

Engine tries 3 times to start

Engine High Coolant Temperature Protection

Shutdown activated after 3 sec delay by NO. Contacts

Engine Low Oil Pressure Protection

Shutdown activated after 3 seconds

Oil Pressure Switch Type : NO. or NC.

Engine Over-speed Protection

Shutdown activated after 5 seconds

50 Hz is activated at 55 Hz ; 60 Hz is activated at 66 Hz

Engine Under Speed Protection

Shutdown activated after 5 seconds

50 Hz is activated at 45 Hz ; 60 Hz is activated at 54 Hz

Emergency Shutdown

Shutdown activated by NO. Contacts

Spare / User define Shutdown

Shutdown activated after 5 sec delay by NO. Contacts

Low Battery Voltage Warning

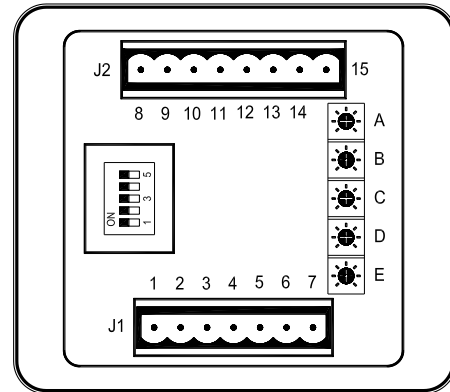
Activated after 5 seconds delay

For 12 Vdc activated at 10 Vdc ; 24 Vdc activated at 20 Vdc

Icon Reference Table

ICON	DESCRIPTION	ICON	DESCRIPTION
	Power Source		Over-speed
	Engine Running		Under-speed
	Start Failure		Emergency Stop
	High Coolant Temperature		Spare Shutdown
	Low Engine Oil Pressure		Low Battery Voltage

Rear Panel Layout



Recommended Cut-Out : 66 * 66 ± 0.5 mm

Adjustment

In the back, the GCU-10 has five adjustment pots that change the time delay functions.

- **A : Engine Pre-Heat** [Adjustable from 2 to 30 sec]
- **B : Starter Cranking time** [Adjustable from 1 to 15 sec]
- **C : Energize to STOP** [Adjustable from 1 to 30 sec]
- **D : Engine Idle (Governor)** [Adjustable from 0 to 300 sec]
- **E : Engine Cool-down** [Adjustable from 0 to 300 sec]

Function Setting

In the back, the GCU-10 has five pins dip switch that set the specification of the genset.

SW 1 : Generator Frequency

ON – 50 Hz OFF – 60 Hz

SW 2 : Battery Voltage

ON – 12V OFF – 24V

SW 3 : Stop Solenoid

ON – Energize to Start OFF – Energize to Stop

SW 4 : Oil Pressure Switch Type

ON – Normal Open NO OFF – Normal Close NC

SW 5 : Oil Pressure Switch (Crank Disconnect)

ON – not used for crank disconnect


OFF – Used for crank disconnect

Specification Summary

ITEM	SPECIFICATION
DC Supply	9 – 36 Vdc
Alternator Input Range	5 – 300 Vac
Alternator Input Frequency	50/60 Hz
Fuel Solenoid Signal Output	5 Amp @ 12/24 Vdc
Start Signal Output	5 Amp @ 12/24 Vdc
Warm up Signal Output	5 Amp @ 12/24 Vdc
Accessory "ON" Output	5 Amp @ 12/24 Vdc
Idle Control Conductor Capacity	5 Amp @ 12/24 Vdc
Operating Temperature	-20 to +60 °C
Relative Humidity	Under 90 %
Power Consumption	Under 3W
Weight	166 g +/- 2%

Manual Operation

To initiate a start sequence moves the front control to MANUAL.



The LED above the knob illuminates indicating the generator is in MANUAL.

First, the pre-heat timer begins by energizing terminal 4. Don't care the terminal 4 output if the pre-heat function is not used.


Second, the Engine Fuel Solenoid is energized by terminal 10, together with governor Idle terminals 14 & 15.

Third, after a 1 sec. delay, the starter motor engages, and the engine cranks for the duration of the crank timer.

Fourth, after the engine fires, the starter motor is disengaged and locked out with an 18-Hertz signal from the generator output. Alternatively, the oil pressure switch can serve as an additional back up crank release.

Fifth, after the engine fires and if the Engine Idle option is activated, the ENGINE RUNNING LED will continuously flash in Idle period indicating the status is IDLE. (If engine idle is not used set adjustment "D" full counterclockwise.)

Sixth, should the engine not fire on the first attempt and the crank timer expires the module will once again attempt to start the engine until the engine fires or after the third attempt is completed.

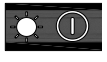


Should the generator fail to start, place the front knob in the OFF (Reset) mode. Establish why the engine failed to fire before making any more start attempts.

After the generator starts, the module allows Oil Pressure, High Engine Temperature, Under speed, and the Auxiliary fault input to stabilize without triggering any faults in 20 seconds. Once the engine is running full fault protection is available.

By moving the knob to the OFF position, the genset will STOP immediately.

Automatic (Remote Mode) Operation



By moving the knob to the "AUTO" mode, the POWER SOURCE LED will start flashing indicating the module is in AUTO and the genset can start at any time.

In the "AUTO" position, the module monitors input terminal 9 for a "REMOTE START" signal. Should a "REMOTE START"

signal be detected a start sequence similar to previous manual start sequence is initiated.

When removing the Remote Start signal the automatic Cool Down delay timer will count down. After the Cool Down ends, the Fuel Solenoid is (de-energized or energized as the case may be) bringing the generator to a stop and the POWER SOURCE LED will start flashing, indicating the genset is on standby and ready to start.

Should the Remote start signal be re-activated during the cooling down period, the set will immediately return to load.

NOTE

Even if the generator is executing Engine Cool down Timer, The Module protection system remain in operation and if any failure occurs, the module bypasses the Engine Cooling Timer shutting down the generator immediately.

OFF Operation

The OFF position places the module into its Stop or Reset mode.

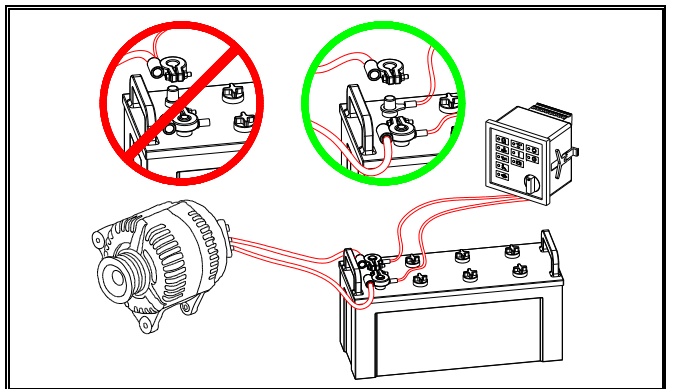
In RESET mode the operator must clear any fault conditions. Selecting OFF when the engine is running automatically STOPS the generator. The fuel supply will be removed and engine will be brought to a standstill. Should a remote start signal be present while operating in this mode, a remote start will not occur.

Installation

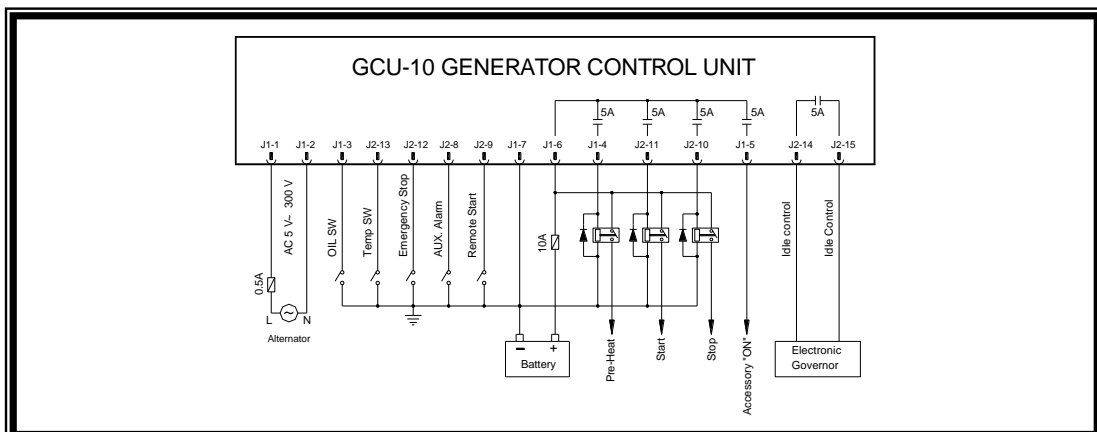
Connect harness according to diagram, in case of battery cable loosen or disconnected, the high voltage from charge alternator it may damage the controller.

NOTE

Never feed charge motor voltage directly into controller, to prevent damage to the controller caused by high charge voltage.



Standard Wiring Diagram



DSP-10

Genset Multi-Function Display Module

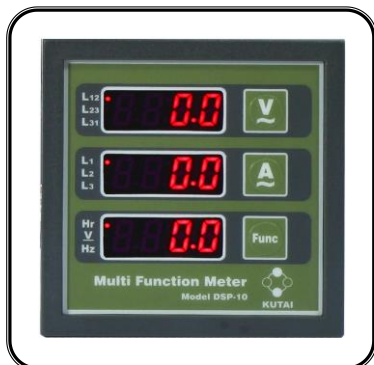


Model DSP-10 is a small integrated digital display showing Voltage, Amp, Hz, and Hour Meter. It can be used individually or jointly with a GCU-10 (Automatic Engine Control Module) and a GCU-11R (Relay Module); jointly they reduce cost, and installation time, simplifying equipment set up.

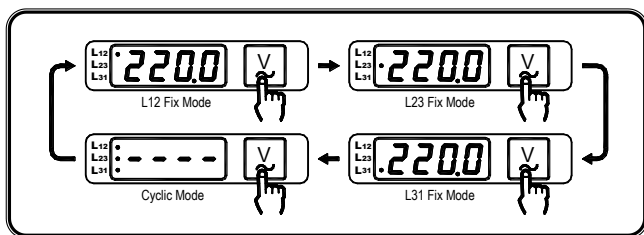
This attractive little display is multitasking and its uses are only limited by your imagination. It is equipped with DIN terminal plugs that improve serviceability. The DSP-10 display can be used in any number of applications where accurate reading of Voltage, Amps and Hertz are needed.

Front Panel Layout and Operation

DSP-10 Display panel has three four Digits bright LED's that shows (RMS) Voltage - Amps - Hertz - Hour Meter and Battery Voltage. The operator can change the display to be fixed or cycling from phase to phase by simply using the button next to each display.



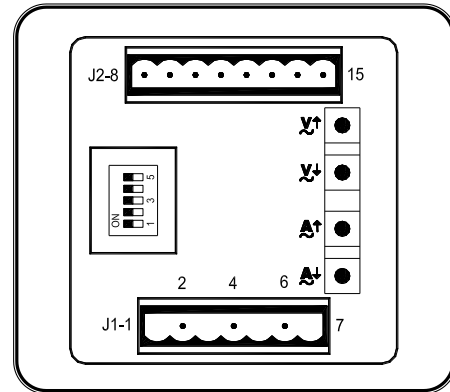
To change the display mode, press the button next to it. See diagram.



Running Hour (Hr) Reset

To reset the Engine Running Hour to zero, press (Func) button on the front panel until the (Hr) mode is displayed, and then press (V) + (A) button together for 5 seconds erasing the EEPROM and the hour meter back to zero.

Rear Panel Layout



Recommended Cut-Out : 66 * 66 ± 0.5 mm

Voltage and Current Adjustment (If Need)

In the back of the DSP-10 module we have 4 push buttons for voltage [V↑ & V↓] and current [A↑ & A↓] adjustment. The Module comes factory tested and calibrated and normally no changes are necessary. But if any modifications are required, follow the procedures below.

Voltage Adjustment

(Please use and accurate RMS Voltmeter as your reference)

1. Start the generator. Set your reference AC voltage using your Voltmeter.
2. Select the desire phase you need to re-calibrate using the front display [V] button on the display and hold.
3. Repeatedly press [V↑] or [V↓] on back of module to adjust the displayed voltage equivalent to your voltmeter.
4. Release the front [V] button. The LED display will flash continuously for 5 seconds.
5. After for 5 seconds then the system will automatically record the new setting and return to normal.
6. If the display shows [FAIL] the setting is invalid, and step 3 must be repeated.

Current Adjustment Procedure

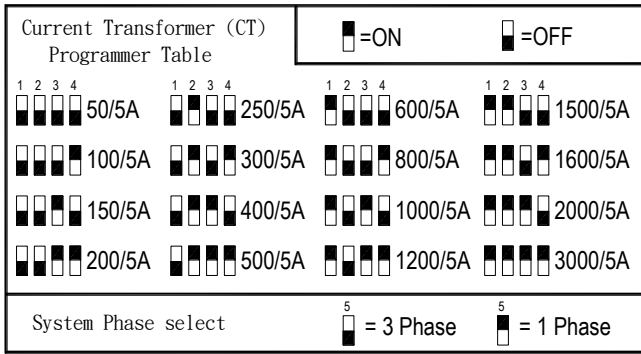
(Please use Standard RMS Current meter for readings)

1. Set the dip switches to the correct [CT] in use.
2. Start the generator. And wait for the generator to stabilize.
3. Slowly add load to the genset until maximum rated load current is reached for the CT in use.
4. Select desire phase current to calibrate using the front [A] button.
5. Repeatedly press [A↑] or [A↓] on the back panel to adjusts the displayed current to its equivalent on the current meter.
6. Release the front [A] button. The LED on the display will flash continuously for 5 seconds.
7. After 5 seconds the system will automatically record the new setting and return to normal.
8. If the panel display shows [FAIL] then the previous setting is invalid, please return to step 5.

Setting The CT Value

Set the 5 pin dip switch for the CT (Current Transformer) and the system phase you are using.

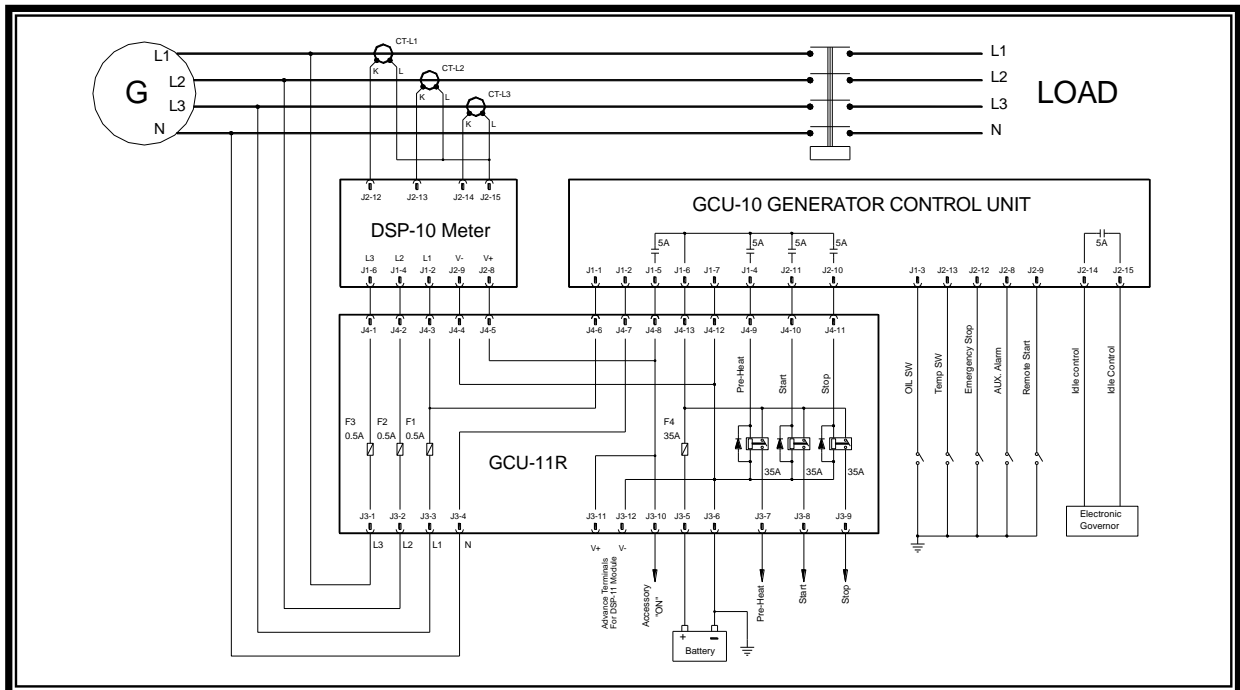
DIP Switch Setting Reference Diagram



Specification

ITEM	DESCRIPTION
DC Supply	9.0 – 36 Vdc
Alternator Input Range	10 – 500 Vac (Ph-Ph)
Alternator Input Frequency	50/60 Hz
CT Burden	Above 2.5VA
CT Secondary	5A
Max. CT Rated	3000A / 5A
Operating Temperature	-20 to +60 °C
Relative Humidity	Under 90 %
Power Consumption	Under 2W
Weight	179 g +/- 2%

Three Phase System Standard Wiring Diagram



Single Phase System Standard Wiring Diagram

